REMARKS

Applicants have amended claims 1 and 2 to more particularly point out and distinctly claim the subject matter which Applicants regard as their invention. Support for the amendments can be found in the specification.[1] Applicants have also cancelled claims 7-12 and added new claims 13-22. Support for the new claims can also be found in the specification.[2] No new matter has been introduced.

Upon entry of the above amendments, claims 1-6 and 13-22 are under examination. Reconsideration of this application, as amended, is requested in view of the following remarks.

Rejections under 35 U.S.C. § 112, second paragraph

The Examiner rejects claims 1 and 2 for being indefinite. More specifically, he points out that three limitations recited in claims 1 and 2 are not clear. Applicants will traverse each below.

First, pointing to the recitation "the fiber cloth is oriented along the surface of the polymer" in claim 1, the Examiner raises two questions: (1) "which surface is being referred?" and (2) "[d]oes this mean that the cloth is located at the surface and is not fully embedded in the polymer?" As to the first question, Applicants have amended claim 1 to make it clear that the surface refers to the outer surface of a polymer composite molded body. Turning to the second question, Applicants believe that claim 1 sets forth that the fiber cloth sheet can be either located

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[1] Applicants have recited in claim 1 a limitation that "the fibers are oriented in a direction not parallel with the direction where the fiber cloth is oriented". This is supported by the recitation "the fibers are oriented in a direction crossing with the fiber cloth" in original claim 1. "[A] direction crossing with the fiber cloth" clearly refers to a direction that is not parallel with the direction in which the fiber cloth is oriented. Also see Fig. 1B. Applicants have also respectively recited in claim 1 "outer surface" and "dispersed" in place of "surface" and "disposed" to more accurately describe the claimed invention. Support for these amendments can also be found in Fig. 1B. Claim 2 recites "the fibers are oriented in a direction substantially perpendicular to the direction where the fiber cloth is oriented." This is equivalent to the limitation recited in original claim 2, but is in more clear form.

[2] Support for new claim 13 can be found at page 9, lines 9-14. New claims 14-18 correspond to original claims 2-6. Support for new claim 19 and new claim 20 can be found at page 5, lines 13-20 and page 9, lines 4-9, respectively. Support for new claim 21 and new claim 22 appears at page 5, line 10 through page 6, line 3 and page 9, lines 9-14.

at the outer surface of a polymer composite molded body or fully embedded in the molded body as long as it is oriented along the outer surface. [3]

Second, pointing to the recitation "the fibers are oriented in a direction crossing with the fiber cloth" in claim 1, the Examiner asserts that it is not clear whether the fibers are in the same plane as the cloth or are perpendicular to the cloth in a different plane. The recitation at issue has been amended to read "the fibers are oriented in a direction not parallel with the direction in which the fiber cloth is oriented." As the direction of the fibers is not parallel with the direction of fiber cloth, it is clear that the fibers are not in the same plane as any fiber cloth and may be perpendicular to a fiber cloth.

Third, the Examiner also asserts that the limitation "the fibers are oriented in a direction substantially perpendicular to each of the fiber cloth" in claim 2 is not clear. Applicants have amended claim 2 to recite "the fibers are oriented in a direction substantially perpendicular to the plane in which the fiber cloth extends."

In view of the above remarks, Applicants submit that amended claims 1 and 2, as well as claims 3-6 dependent from claim 1, are definite.

Rejections under 35 U.S.C. § 103(a)

The Examiner rejects claims 1-6 for being obvious over JP 2002212310 (JP '310). Applicants disagree and will first discuss claim 1, the only independent claim.

Claim 1, as amended, covers a polymer composite molded body including (1) a polymer matrix, (2) a fiber cloth disposed in the polymer matrix, and (3) fibers dispersed in the polymer matrix. The fiber cloth is oriented along the outer surface of the polymer composite molded body, and the fibers are oriented in a direction not parallel with the direction in which the fiber cloth is oriented.

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[3] As shown in Figures 2A and 2B, to prepare a polymer composite molded body, a fiber is first placed in a die, a composition containing a polymer matrix and fibers are then added to the die, and finally the fiber cloth and the composition are molded in a magnetic field. In this example, as the fiber cloth is placed on the bottom, it ends up being located at, or embedded (as a result of molding) near, the outer surface of the polymer composite molded body thus prepared.

JP '310 discloses a molded article containing a polymer material and a polyester fiber. In the article, the polyester fibers are embedded in the polymer material and oriented in a single direction. According to JP '310, the article may further contain fabrics to reinforce the molded article. See paragraph [0054]. This reference is silent on the orientation of the fabrics relative to the surface of the article and the oriented polyester fiber in the article. By contrast, in the molded body of claim 1, a fiber cloth (the counterpart of the fabrics in JP '310) is oriented in a direction along the molded body, and fibers (the counterpart of the polyester fibers in JP '310) are oriented in a direction not parallel with the direction in which the fiber cloth is oriented. Due to this unique design, the molded body of claim 1 has improved properties. See Table 1 of the present specification (page 23). More specifically, this table shows that the claimed molded body has low linear expansion coefficients in all three dimensions, X, Y, and Z.

As JP '310 does not teach or even suggest the above-described unique design, it does not render obvious claim 1, which requires the unique design. For the same reasons, claims 2-6, dependent from claim 1, are also not rendered obvious by JP '310.

Patentability of new claims 13-22

New claims 13-20 depend from claim 1. As claim 1 is patentable over JP '310, so are new claims 13-20.

New claims 21 and 22 are independent, each covering a polymer composite molded body. Of note, the molded bodies of new claims 21 and 22 both feature that the fiber cloth is impregnated with fibers. See the recitation "some of the fibers penetrate into the pores of the fiber cloth" in claim 21 and the recitation "some of the fibers are located in the fiber cloth" in claim 22. JP '310 does not teach or even suggest this feature, which contributes to enhanced mechanical and thermal properties. Thus, new claims 21 and 22 are patentable over JP '310.

CONCLUSION

Applicants submit that the rejections asserted by the Examiner have been overcome and claims 1-6 and 13-22, as pending, cover subject matter that are nonobvious over the cited prior art. Applicants respectfully request that the Examiner allow this application.

Please apply any charges to deposit account 06-1050.

Respectfully submitted,

Date: 10-17-05

Y. Rocky Tsao

Y. Rocky Tsao, Ph.D., J.D.
Attorney for Applicants
Reg. No. 34,053

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110
Telephone: (617) 542-5070
Facsimile: (617) 542-8906